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**From:** Dan Johnson [DanJohnson@florencecopper.com]  
**Sent:** 11/2/2018 12:34:02 AM  
**To:** Rumrill, Nancy [Rumrill.Nancy@epa.gov]  
**CC:** Albright, David [Albright.David@epa.gov]; Maribeth E. Greenslade [Greenslade.Maribeth@azdeq.gov]  
**Subject:** Low-Flow Sampling Discussion  
**Attachments:** ATT00001.txt

Hi Nancy,

Below is discussion on the low-flow sampling program for the PTF observation wells:

*The low flow method of sampling is widely used to collect environmental compliance samples from monitor wells. The low flow method reduces the impacts from higher flow rates, and resulting drawdown, on natural background flow and chemical process in the formation when compared to conventional pumping / purging methods. Low flow can also reduce turbidity in the samples versus conventional purging methods. The low-flow method minimizes drawdown in the pumped well, to reduce disturbance, while collecting a representative sample of the groundwater. The sampling protocol is similar to standard purging methods, in that stable field parameters such as temperature, pH, and conductivity, are confirmed prior to collecting the sample.*

*APP P-106360 requires a fluid electrical conductivity measurement to be collected daily from each of the seven Observation wells. The low-flow sample collection method was chosen to reduce drawdown during sampling, so that a minimal gradient is created in the direction of the observation wells. Standard purging methods would risk drawing leaching solutions towards the Observation wells and could influence the calculations of inward hydraulic gradients towards the PTF recovery wells.*

Please let me know if you questions about this description. Have a good evening!

**Dan Johnson** VP | General Manager



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